

# **Methodology and Assumptions for the State and County Population Projections: July 1, 2010-2060**

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## **Data Sources**

The California Department of Public Health provided the vital statistics (births and deaths) used to develop these projections. The Department of Finance's own estimates of total county and state population correspond to the E-2 Report: *California County Population Estimates and Components of Change by Year, July 1, 2010-2012*. In response to a 2012 survey, planning experts of several counties and Councils of Government contributed assessments of future migration and population for their jurisdictions.

The U.S. Census Bureau provided the 2000 and 2010 Census Modified Race (MR) files ([www.census.gov](http://www.census.gov)). The total population by geographic area matches previously published counts in the 2000 and 2010 Census; however, the age, race, and gender details in the modified counts do not match published data. (See the Technical Notes and Assumptions below.)

## **Technical Notes**

The Department of Finance uses a baseline cohort-component method to project population by age, gender, and race/ethnicity. For this projection series, there are seven mutually exclusive race/ethnic groups: Hispanics and non-Hispanic American Indians, Asians, Blacks, Multi-Race persons, Pacific Islanders and Whites. A baseline projection assumes people have the right to migrate where they choose and no major natural catastrophes or war will befall the state or the nation. A cohort-component method traces people born in a given year through their lives. As each year passes, cohorts change due to the mortality and migration assumptions. Applying the fertility assumptions to the women of childbearing age forms new cohorts.

## **Special Populations**

The primary sources of special populations are prisons, colleges, and military installations. Special populations display very different demographic characteristics and behavior. In counties where special populations represent a significant proportion of a specific race/ethnic population, they were removed from the base and projected separately. For prison and military populations, the determination was made based on an examination of sex ratios and, to a lesser extent, the age structure. College adjustments were based on an examination of age structure. Forecasts from the Department of Corrections, the California Youth Authority and the various college campuses were used to determine the timing and capacity of facilities. In most other instances, the special populations were held at the 2010 level.

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## **Survival, Fertility and Migration Proportions**

Survival rates are constructed separately for men and women at the state level for each of seven race/ethnic groups. A life table was created for each race/ethnic group by sex using a three-year average of death data (Vital Statistics 2008, 2009, and 2010) and the 2010 Census Bureau's MR file population. The survival rate for each race/ethnic group by sex is taken from the life table and used as the starting rate for 2010.

A set of six 5-year age-specific fertility rates (ASFRs for the age range 15-44) for each of seven race/ethnic groups was calculated for each county for each year of the period 2008-2011. For the numerators of these rates, births to mothers under age 15 were added to the youngest age group, births to mothers of unknown age were added to the births of the largest birth group and births to mothers over age 44 were added to births of the oldest age group. The Census Bureau's MR file was used as the denominator by age, gender and race/ethnic group for each county. ASFRs were then averaged for each race/ethnic group by county to derive beginning fertility rates for the projections. In several counties it was apparent that the census counts and the vital statistics were inconsistent, particularly for the Multi-Race category. In these cases, the rates were adjusted to reflect census results. As a final step, fertility rate generated births, were adjusted to be consistent with actual fiscal birth totals for 2010-2011.

Migration proportions were developed for the decade of the 2000s by a survived population method. The 2000 population was aged forward in time to 2010 by adding recorded births to form new cohorts and subtracting deaths from existing cohorts. The survived 2000 population was compared to the 2010 population and differences were assumed to be migration. The ten-year migration was annualized and divided by the total to derive a proportion, and a five-point triangular smoothing function was used to complete the migration proportions.

## **Assumptions**

**Base Population**—For the benchmark (or starting population), the Department of Finance used the 2010 Census counts as modified by the Bureau of the Census to eliminate the "Other" race category. These counts represent a modification to the race distribution of the census count and not an adjustment for undercount to the total. These race groups are consistent with the population that is being used by the Census Bureau for current estimates as well as the national projections. The Department of Finance further refines this base population for special populations as discussed earlier.

**Fertility**—The projections assume that each county's race/ethnic-specific and age-specific fertility rates eventually merge toward a state norm forecast of fertility rates by age and race/ethnic group. Depending on historical trends, local area fertility was either allowed to follow state trends or merged to the state norm in 50 years. The state fertility norms as expressed in term of total fertility are as follows:

- Non-Hispanic Whites: 1.82
- Non-Hispanic Blacks: 1.84
- Non-Hispanic American Indians: 1.75
- Non-Hispanic Asians: 1.79
- Non-Hispanic Native Hawaiian and Other Pacific Islanders: 2.01
- Non-Hispanic Multi-Race: 1.84
- Hispanic 2.22

**Migration**—The Department of Finance relied on the expertise of local agencies to assist in the development of local area migration assumptions. When local input was not available, the migration assumptions were made by the Department of Finance based on historical analysis of the county's migration patterns. The sum of the county net migration assumptions averages 148,000 over the 50-year period.

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**Mortality**—Evaluation of the life tables by county, gender, and race/ethnic group indicated that county tables contain many small data cells that could not deliver consistent results. Therefore, statewide survival rates by gender and race/ethnic group were used for all counties in California.

State-level survival rates were merged to the 2060 state-level rates based on national-level race/ethnic and gender-specific survival rates published by the US Census Bureau. It was assumed that the higher of the state rate or the national rate for each race/ethnic, age, and gender-specific group would be used as the group's 2060 survival rate.

The difference in life-expectancy between Hispanics and Non-Hispanics that currently exists is projected to grow smaller over time. Current research is unclear whether the disparity is a real or a statistical artifact and therefore the Hispanic 2060 survival rate is modeled as the average of the 2060 survival rates of non-Hispanic Whites and 2060 Hispanic survival rate.

The implied 2060 life expectancies by race/ethnic group and gender are:

▪ Non-Hispanic White Females:	86.2
▪ Non-Hispanic White Males:	85.2
▪ Non-Hispanic Black Females:	80.7
▪ Non-Hispanic Black Males:	78.0
▪ Non-Hispanic American Indian Females:	87.0
▪ Non-Hispanic American Indian Males:	81.5
▪ Non-Hispanic Asian Females:	89.2
▪ Non-Hispanic Asian Males:	87.7
▪ Non-Hispanic Hawaiian/Pacific Islander Females:	85.3
▪ Non-Hispanic Hawaiian/Pacific Islander Males:	83.2
▪ Non-Hispanic Multi-Race Females:	89.4
▪ Non-Hispanic Multi-Race Males:	86.3
▪ Hispanic Females:	85.4
▪ Hispanic Males:	84.1

### Demographic Model

The benchmark population was projected using the fertility, mortality and migration assumptions. Applying the fertility assumptions to the women of childbearing ages creates new cohorts. The population ages with time, as the gender, race/ethnic, and age-specific survival rates are applied to the population at risk. In addition, the overall migration assumptions by race/ethnicity are distributed using the assumed gender and age proportions. The process is carried forward for 50 years from 2010. Special populations are then added to produce total population projections. For the period 2010 and 2012, the populations are benchmarked to the Department's 2012 E-2 Report. These population projections depict only one possible course of future population change, i.e., the one reflecting recent trends in fertility, mortality, and migration. These projections do not necessarily show what is most desirable but rather what can be reasonably expected if current trends continue until the year 2060.

The State and County Population Projections are online at  
[www.dof.ca.gov/research/demographic/reports/projections/](http://www.dof.ca.gov/research/demographic/reports/projections/)